1-1-1982

Test 1461: John Deere 4850 Powershift Diesel 15-Speed

Tractor Museum
University of Nebraska-Lincoln, TractorMuseumArchives@unl.edu

NEBRASKA TRACTOR TEST 1461
JOHN DEERE 4850 POWERSHIFT DIESEL
15 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—998 rpm)								
192.99 (143.91)	2200	11.046 (41.814)	0.399 (0.243)	17.47 (3.442)	194 (90.1)	59 (15.1)	75 (23.7)	29.223 (98.683)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
166.58 (124.22)	2233	9.883 (37.411)	0.414 (0.252)	16.86 (3.320)	188 (86.7)	58 (14.2)	72 (21.9)	....
0.00 (0.00)	2333	2.579 (9.763)	....	....	172 (77.5)	57 (13.9)	71 (21.7)	....
85.18 (63.52)	2288	6.211 (23.511)	0.509 (0.310)	13.71 (2.702)	183 (83.9)	60 (15.3)	74 (23.6)	....
191.94 (143.13)	2199	11.039 (41.787)	0.401 (0.244)	17.39 (3.425)	196 (91.1)	60 (15.8)	76 (24.4)	....
43.00 (32.07)	2302	4.518 (17.102)	0.733 (0.446)	9.52 (1.875)	176 (80.3)	62 (16.4)	76 (24.2)	....
126.56 (94.38)	2263	8.068 (30.541)	0.445 (0.271)	15.69 (3.090)	185 (85.0)	60 (15.3)	74 (23.1)	....
Av 102.21 *Av (76.22)*	**2270**	**7.050** *(26.687)*	**0.481** *(0.293)*	**14.50** *(2.856)*	**183** *(84.1)*	**59** *(15.2)*	**74** *(23.2)*	**29.240** *(98.739)*

DRAWBAR PERFORMANCE WITH BIAS PLY TIRES

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 10th Gear											
162.53 (121.20)	9875 (43.92)	6.17 (9.93)	2199	4.54	11.069 (41.900)	0.475 (0.289)	14.68 (2.892)	188 (86.7)	49 (9.4)	56 (13.1)	28.690 (96.882)
75% of Pull at Maximum Power—Ten Hours 10th Gear											
127.90 (95.37)	7496 (33.34)	6.40 (10.30)	2249	3.31	9.267 (35.080)	0.506 (0.308)	13.80 (2.719)	183 (83.6)	49 (9.6)	58 (14.2)	28.762 (97.125)
50% of Pull at Maximum Power—Two Hours 10th Gear											
87.52 (65.26)	4998 (22.23)	6.57 (10.57)	2287	2.26	7.290 (27.595)	0.581 (0.354)	12.01 (2.365)	176 (79.7)	38 (3.1)	42 (5.3)	28.805 (97.270)
50% of Pull at Reduced Engine Speed—Two Hours 13th Gear											
87.54 (65.28)	4997 (22.23)	6.57 (10.57)	1434	2.26	5.857 (22.171)	0.467 (0.284)	14.95 (2.944)	179 (81.4)	45 (6.9)	53 (11.7)	28.805 (97.270)
MAXIMUM POWER IN SELECTED GEARS											
142.44 (106.22)	18789 (83.58)	2.84 (4.58)	2231	14.95	5th Gear			184 (84.4)	47 (8.3)	50 (10.0)	28.680 (96.848)
158.79 (118.41)	17935 (79.78)	3.32 (5.34)	2200	11.18	6th Gear			184 (84.4)	48 (8.9)	51 (10.6)	28.690 (96.882)
165.73 (123.58)	15745 (70.04)	3.95 (6.35)	2200	8.26	7th Gear			188 (86.7)	48 (8.9)	52 (11.1)	28.700 (96.916)
162.86 (121.44)	13168 (58.57)	4.64 (7.46)	2199	6.22	8th Gear			191 (88.3)	51 (10.6)	60 (15.6)	28.640 (96.713)
163.35 (121.81)	11342 (50.45)	5.40 (8.69)	2199	5.21	9th Gear			192 (88.6)	51 (10.6)	59 (15.0)	28.650 (96.747)
164.65 (122.78)	9994 (44.45)	6.18 (9.94)	2200	4.42	10th Gear			188 (86.4)	49 (9.4)	57 (13.9)	28.670 (96.814)
165.23 (123.21)	8664 (38.54)	7.15 (11.51)	2197	3.94	11th Gear			190 (87.8)	51 (10.6)	61 (16.1)	28.640 (96.713)
171.27 (127.72)	7988 (35.53)	8.04 (12.94)	2198	3.53	12th Gear			191 (88.3)	51 (10.6)	61 (16.1)	28.640 (96.713)

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	2200	1983	1760	1538	1322	1103
Pull—lbs (kN)	9994 (44.45)	11432 (50.85)	12617 (56.12)	13213 (58.77)	12568 (55.91)	10413 (46.32)
Increase in Pull %	0	14	26	32	26	4
Power—Hp (kW)	164.65 (122.78)	168.35 (125.54)	163.90 (122.22)	149.46 (111.45)	122.55 (91.38)	85.70 (63.91)
Speed—Mph (km/h)	6.18 (9.94)	5.52 (8.89)	4.87 (7.84)	4.24 (6.83)	3.66 (5.88)	3.09 (4.97)
Slip %	4.42	5.21	5.84	6.15	5.84	4.90

		Radial Ply			Bias Ply
TRACTOR SOUND LEVEL WITH CAB	**RATED RPM**	**1700 dB(A)**	**2000 dB(A)**	**2200 dB(A)**	**2200 dB(A)**
Maximum Available Power—Two Hours		74.5	74.0	75.5	75.5
75% of Pull at Maximum Power—Ten Hours					75.0
50% of Pull at Maximum Power—Two Hours					74.5
50% of Pull at Reduced Engine Speed—Two Hours					72.5
Bystander in 15th gear					87.5

Department of Agricultural Engineering

Dates of Test: October 11 to November 11, 1982

Manufacturer: JOHN DEERE TRACTOR WORKS, P.O. Box 270, Waterloo, Iowa 50702

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.6 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8382 **Fuel weight** 6.979 lbs/gal *(0.836 kg/l)* **Oil SAE** 15W-40 **API service classification** CD, CC, SD **To motor** 4.759 gal *(18.014 l)* **Drained from motor** 4.211 gal *(15.941 l)* **Transmission and final drive lubricant** John Deere Hy-Gard transmission and hydraulic fluid **Total time engine was operated** 67.5 hours.

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** *RG6466A231046* **Crankshaft** lengthwise **Rated rpm** 1700 to 2200 **Bore and stroke** 4.57" × 4.75" *(116.0 mm × 120.6 mm)* **Compression ratio** 15.0 to 1 **Displacement** 466 cu in *(7636 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** two paper elements with prestrainer **Muffler** vertical **Cooling medium temperature control** three thermostats and variable speed fan.

CHASSIS: Type standard with duals **Serial No.** *RW4850P001113* **Tread width** rear 63" *(1600 mm)* to 130" *(3300 mm)* front 60.2" *(1530 mm)* to 86.3" *(2192 mm)* **Wheel base** 118.5" *(3010 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 31.9" *(810 mm)* Vertical distance above roadway 45.3" *(1151 mm)* Horizontal distance from center of rear wheel tread 0.3" *(8 mm)* to the right **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Advertised speeds mph *(km/h)*** first 1.3 *(2.1)* second 1.9 *(3.1)* third 2.3 *(3.7)* fourth 2.9 *(4.7)* fifth 3.3 *(5.3)* sixth 3.8 *(6.1)* seventh 4.3 *(7.0)* eighth 5.0 *(8.0)* ninth 5.7 *(9.2)* tenth 6.5 *(10.5)* eleventh 7.5 *(12.0)* twelfth 8.4 *(13.5)* thirteenth 10.4 *(16.7)* fourteenth 14.5 *(23.4)* fifteenth 18.0 *(29.0)* reverse 1.8 *(2.9)*, 2.6 *(4.2)*, 4.0 *(6.4)*, 6.0 *(9.7)* **Clutch** wet multiple disc hydraulically power actuated and operated by foot pedal **Brakes** wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 165" *(4.2 m)* left 165" *(4.2 m)* (on concrete surface without brake) right 181" *(4.6 m)* left 181" *(4.6 m)* **Turning space diameter** (on concrete surface with brake applied) right 346" *(8.79 m)* left 346" *(8.79 m)* (on concrete surface without brake) right 380" *(9.65 m)* left 380" *(9.65 m)* **Power take-off** 998 rpm at 2200 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

SUPPLEMENTAL TESTS
DRAWBAR PERFORMANCE WITH RADIAL PLY TIRES

POWER AND FUEL CONSUMPTION AT 2200 RPM

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 10th Gear											
164.73 (122.84)	9482 (42.18)	6.52 (10.49)	2201	2.20	11.033 (41.765)	0.467 (0.284)	14.93 (2.941)	185 (85.0)	42 (5.3)	44 (6.4)	29.005 (97.946)
MAXIMUM POWER IN SELECTED GEARS											
149.37 (111.38)	20810 (92.57)	2.69 (4.33)	2236	10.00	4th Gear			182 (83.1)	40 (4.4)	41 (5.0)	28.980 (97.861)
161.81 (120.66)	19252 (85.63)	3.15 (5.07)	2200	7.07	5th Gear			183 (83.9)	40 (4.4)	42 (5.6)	28.990 (97.895)
171.05 (127.56)	17568 (78.15)	3.65 (5.88)	2200	5.08	6th Gear			183 (83.9)	39 (3.9)	41 (5.0)	29.010 (97.962)
172.60 (128.71)	15179 (67.52)	4.26 (6.86)	2199	3.68	7th Gear			185 (84.7)	39 (3.9)	41 (5.0)	29.000 (97.929)
166.57 (124.21)	12634 (56.20)	4.94 (7.96)	2198	2.93	8th Gear			187 (86.1)	39 (3.9)	41 (5.0)	29.000 (97.929)
165.25 (123.23)	10810 (48.09)	5.73 (9.23)	2200	2.33	9th Gear			186 (85.3)	39 (3.9)	42 (5.6)	29.010 (97.962)
167.10 (124.61)	9607 (42.73)	6.52 (10.50)	2200	1.99	10th Gear			187 (85.8)	38 (3.3)	41 (5.0)	29.010 (97.962)
166.11 (123.87)	8258 (36.73)	7.54 (12.14)	2202	1.73	11th Gear			188 (86.4)	38 (3.3)	41 (5.0)	29.000 (97.929)
171.85 (128.15)	7630 (33.94)	8.45 (13.59)	2200	1.55	12th Gear			186 (85.6)	38 (3.3)	41 (5.0)	29.000 (97.929)

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	2200	1984	1761	1538	1311	1108
Pull—lbs (kN)	9607 (42.73)	11119 (49.46)	12336 (54.87)	13058 (58.08)	11844 (52.68)	10234 (45.52)
Increase in Pull %	0	16	28	36	23	7
Power—Hp (kW)	167.10 (124.61)	173.77 (129.58)	170.57 (127.19)	157.34 (117.33)	122.02 (90.99)	89.46 (66.71)
Speed—Mph (km/h)	6.52 (10.50)	5.86 (9.43)	5.19 (8.34)	4.52 (7.27)	3.86 (6.22)	3.28 (5.28)
Slip %	1.99	2.33	2.67	3.01	2.67	2.16

POWER AND FUEL CONSUMPTION AT 2000 RPM
POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—One Hour (PTO Speed—907 rpm)								
199.94 (149.10)	2000	10.943 (41.424)	0.382 (0.232)	18.27 (3.599)	195 (90.7)	59 (15.2)	75 (23.8)	29.225 (98.688)

DRAWBAR PERFORMANCE WITH RADIAL PLY TIRES

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 10th Gear											
172.11 (128.34)	10942 (48.67)	5.90 (9.49)	1999	2.59	11.033 (41.765)	0.447 (0.272)	15.60 (3.073)	189 (86.9)	43 (6.1)	47 (8.1)	28.970 (97.827)
MAXIMUM POWER IN SELECTED GEARS											
177.70 (132.51)	17411 (77.45)	3.83 (6.16)	1997	4.92	7th Gear			186 (85.3)	39 (3.9)	41 (5.0)	29.000 (97.929)
174.42 (130.06)	11074 (49.26)	5.91 (9.51)	1999	2.42	10th Gear			187 (86.1)	38 (3.3)	41 (5.0)	29.000 (97.929)
179.63 (133.95)	8787 (39.08)	7.67 (12.34)	2002	1.81	12th Gear			187 (86.1)	38 (3.3)	41 (5.0)	29.000 (97.929)

POWER AND FUEL CONSUMPTION AT 1700 RPM
POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—One Hour (PTO Speed—771 rpm)								
189.76 (141.50)	1700	10.110 (38.271)	0.372 (0.226)	18.77 (3.697)	199 (92.7)	60 (15.7)	75 (23.7)	29.220 (98.672)

DRAWBAR PERFORMANCE WITH RADIAL PLY TIRES

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 10th Gear											
166.86 (124.43)	12532 (55.75)	4.99 (8.04)	1700	2.93	10.335 (39.121)	0.432 (0.263)	16.15 (3.181)	193 (89.4)	46 (7.8)	52 (10.8)	28.925 (97.675)
MAXIMUM POWER IN SELECTED GEARS											
166.47 (124.13)	19591 (87.15)	3.19 (5.13)	1700	6.99	7th Gear			187 (85.8)	39 (3.9)	41 (5.0)	29.010 (97.962)
167.80 (125.13)	12579 (55.95)	5.00 (8.05)	1701	2.84	10th Gear			188 (86.4)	38 (3.3)	41 (5.0)	29.000 (97.929)
172.94 (128.96)	9987 (44.42)	6.49 (10.45)	1700	2.07	12th Gear			186 (85.6)	38 (3.3)	41 (5.0)	29.000 (97.929)

TIRES, BALLAST AND WEIGHT		Bias Ply Tires		Radial Ply Tires	
		With Ballast	Without Ballast	With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi (kPa)	Four 20.8-38; 10; 16 (110)	Four 20.8-38; 10; 16 (110)	Four 20.8R38; 10; 12 (85)	Four 20.8R38; 10; 12 (85)

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump return was maintained at 125°F (51.7°C). Eight gears were chosen between 15% slip (bias ply tires), stability limit (radial ply tires) and 10 mph (16.1 km/h).

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1461.**

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
W. E. SPLINTER
L. L. BASHFORD
Board of Tractor Test Engineers

John Deere 4850 Powershift Diesel